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April 9, 2003

Bruce Morrison
USEPA Region VII
901 North 5th Street
Kansas City, KS 66101

40322439
Superfund

Re: The relationship between street dust and yard soil in Herculaneum

Dear Bruce:

Enclosed is a memorandum from Dr. Terri Bowers of Gradient Corporation, which discusses the relationship of street dust to nearby soils. This is a relationship, which you have mentioned, for some time now, that we need to develop. In fact, as late as the meeting in Jefferson City on March 14, 2003, you raised the point that none of us have a risk-based benchmark for this.

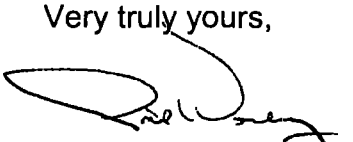
The figures calculate the increase in soil leads in the top one-inch of soils for a ten-year period. To extrapolate to longer or shorter time periods the relationship is directly proportional to the length of time. In the memo she states "Comparison of these values to the U.S. EPA residential soil screening level for lead of 400 mg/kg suggests that the increased risk to human health will be minimal."

The Herculaneum Transportation Plan draft submitted April 2, 2003, does not rely on street dust values as a trigger mechanism for regular concentrate truck cleaning. However, you indicated that your agency would continue to monitor street lead levels as a mechanism for judging relative performance. In the plan, Doe Run does propose tying the initiation of product truck washing, or vacuuming as may be determined to be the best solution, to street dust measurements. Hopefully, this memorandum will give you some basis to assist

you in gauging that proposal and your own longer-range decisions in this regard.

In accordance with our conversations in Kansas City some months ago, we are not releasing this memorandum to anyone other than yourself, Dave Mosby, and Scott Clardy, at this time, nor are we posting it on our website or referring to it directly in our transportation plans. However, if any of you have any questions on her methodology and wish to speak directly with her about this, feel free to do so.

Very truly yours,



Daniel L. Vornberg

cc: David Mosby, MO DNR
Scott Clardy, MO DHSS

Bcc: Clif Gray
Aaron Miller
Barb Shepard
Lou Marucheau
Jerry Pyatt

Memorandum

Gradient
CORPORATION

To: Dan Vornberg **Date:** April 2, 2003

From: Terri Bowers

Subject: Impact of street dust on nearby soils

This memo summarizes the potential impact of street dust with elevated lead concentrations on nearby soils by quantifying the expected increase in lead concentration in soils adjacent to streets that may occur as a result of traffic and wind patterns.

The Industrial Source Complex, Short Term (ISCST3) air model, Version 02035, recommended by U.S. EPA for regulatory purposes (U.S. EPA, 1995), was used to predict the annual average air lead concentrations along a street that would result solely from particulate re-entrainment in the air due to vehicular traffic on the haul roads, and to estimate the long-term surface deposition rate of lead from the resuspended street dust. The emissions of street dust particles to the air were calculated for example lead dust loading values of 2 mg/ft^2, 5 mg/ft^2, and 10 mg/ft^2, and total street dust loading values were calculated to correspond to a constant lead dust concentration of 16,000 mg/kg in each case. A total of 1100 vehicles per day were assumed to travel on the street, comprised of 50 fully-loaded trucks and 1050 cars. The street was assumed to be oriented east-west because the prevailing wind patterns will result in the maximum impact on nearby soils for this orientation. The resuspended street dust particles were assumed to be 10 μm in size.

Meteorological data for the air modeling were derived from the St. Louis Lambert Field airport National Weather Service station. To calculate soil lead concentrations in soil adjacent to the street, a total time interval over which deposition occurs and a well-mixed soil depth of the lead concentrations are necessary. For these calculations, 10 years of cumulative deposition onto soil and a well-mixed depth of 2.5 cm (1 inch) were assumed.

Figure 1 below presents the predicted soil lead concentrations for the 2 mg/ft^2 lead dust loading example, after 10 years of deposition of resuspended street dust, as a function of distance from each edge of the east-west street. Likewise, Figures 2 and 3 present the predicted soil lead concentrations for the 5 mg/ft^2 and 10 mg/ft^2 lead dust loading examples. As shown in the figures, because the predominant winds are from the south in the St. Louis area, the northern side of an east-west street will receive both higher air concentrations and higher soil deposition. The highest predicted soil lead concentrations occur at the northern edge of the east-west street, with predicted soil lead values of 29 mg/kg for the 2 mg/ft^2

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lead dust loading example, 53 mg/kg for the 5 mg/ft^2 lead dust loading example, and 83 mg/kg for the 10 mg/ft^2 lead dust loading example.

These figures show that after ten years, the maximum increase in lead concentration to nearby soils is approximately 80 mg/kg for the highest example lead dust loading value of 10 mg/ft^2. This corresponds to an approximate 8 mg/kg per year increase in soil lead concentration. Comparison of these values to the U.S. EPA residential soil screening level for lead of 400 mg/kg suggests that the increased risk to human health will be minimal.

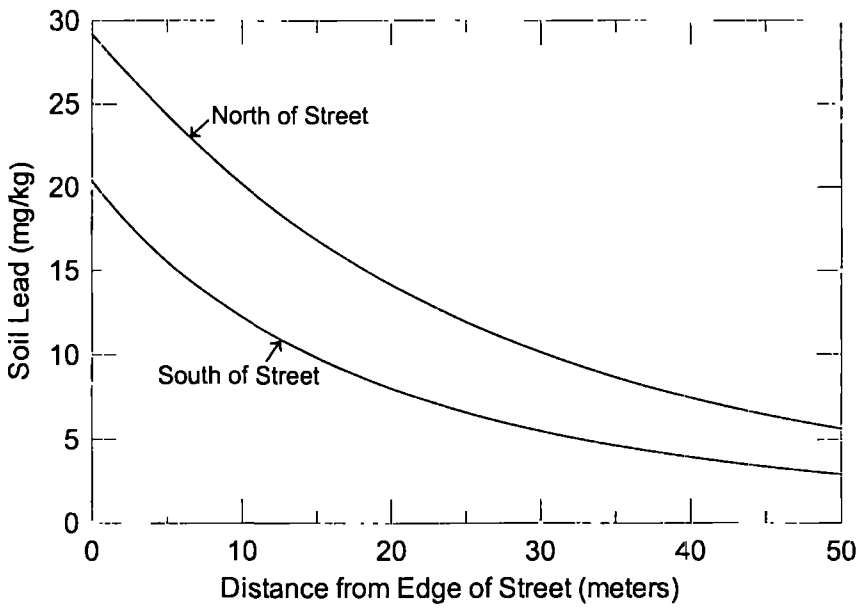

Figure 1. Cumulative Soil Lead Concentrations after 10 Years of Deposition from an East-West Street at 2 mg/ft^2 Lead Dust Loading

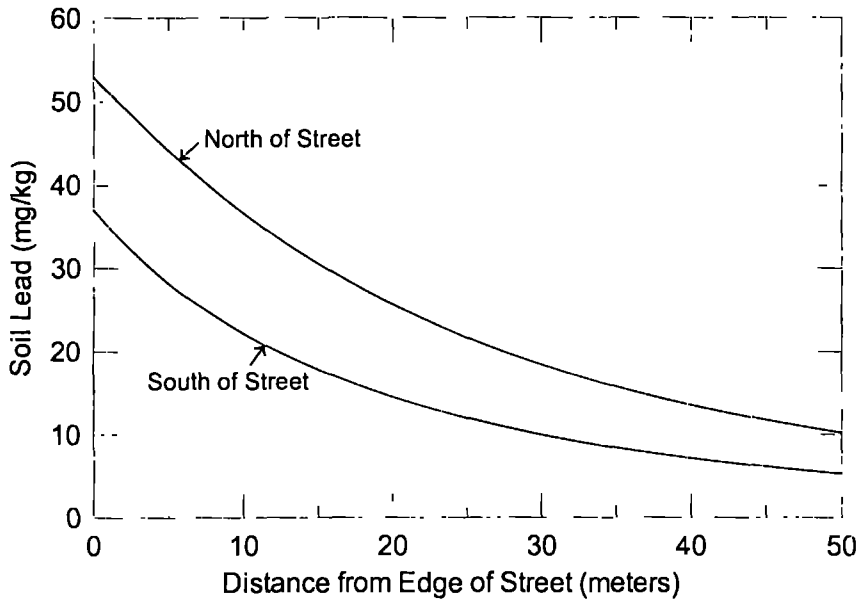

Figure 2. Cumulative Soil Lead Concentrations after 10 Years of Deposition from an East-West Street at 5 mg/ft^2 Lead Dust Loading

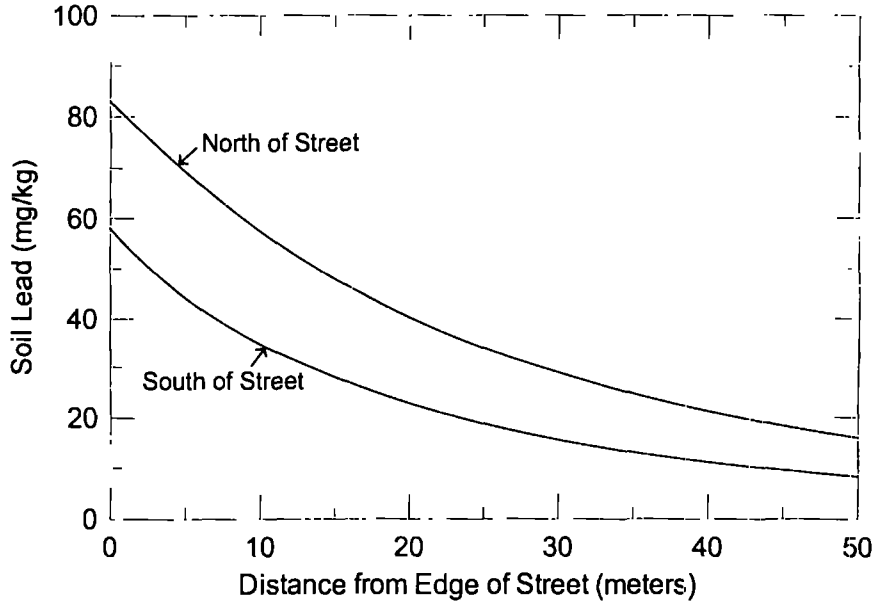

Figure 3. Cumulative Soil Lead Concentrations after 10 Years of Deposition from an East-West Street at 10 mg/ft^2 Lead Dust Loading